CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR - MARKET RESEARCH STATUS

- O INTERVIEWS WERE COMPLETED LAST WEEK WITH 850 INTERVIEWS OUT OF A PLANNED 900. EVERY CATEGORY ACHIEVED MORE THAN 85% OF QUOTA EXCEPT FOR PRACTICING SCIENTISTS WHICH ACHIEVED 74%.
- THREE CONCEPTS WERE PRESENTED:
 - ALPHANAMERIC KEYSTROKE PROGRAMMABLE SIMILAR TO TI-88.
 - ONE LINE BASIC PROGRAMMABLE WITH PLUG-IN SOFTWARE.
 - SIX LINE PROFESSIONAL PRODUCT WITH PLUG IN LANGUAGE (VISICALC, DATACOM, BASIC).
- GOALS OF THE RESEARCH:
 - COMPARISON OF KEYSTROKE VERSUS BASIC PROGRAMMING BY TYPE OF USER AND BACKGROUND
 - ROUGH PRICE/VOLUME FOR EACH CONCEPT
 - FEATURE RANKING AND INPUTS FOR CONCEPT IMPROVEMENT
- MCCANN ERICKSON WILL PRESENT THEIR REPORT ON SURVEY RESULTS ON JULY 8.

06-17-81 CBW 39-815

CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR COMPETITIVE OUTLOOK

- CASIO INTROUDCED FX-702P AT CES WHICH IS SIMILAR TO SHARP PC-1211 EXCEPT FOR FASTER SPEED, ADDITIONAL BUILT IN FUNCTIONS AND MORE STEPS (1680 VS 1424). THESE PRODUCTS DO NOT HAVE PLUG IN SOFTWARE OR MEMORY EXPANSION AND HAVE LIMITED I/O (CASSETTE AND PRINTER).
- IT APPEARS THAT RADIO SHACK WILL REPLACE THE PC-1211 IN THE NEAR FUTURE WITH ANOTHER PRODUCT, PROBABLY OF HIGHER PERFORMANCE. PANASONIC/QUASAR SHOULD BE ON THE MARKET SHORTLY. HP WILL PROBABLY INTRODUCE A BASIC LANGUAGE PRODUCT SOON. XEROX HAS BEEN WORKING ON A TWO LINE PORTABLE LCD PRODUCT IN LINE WITH THEIR "STAR" AND "WORM". ALL THESE PRODUCTS CAN BE EXPECTED TO BE MORE POWERFUL WITH PLUG IN S/W, EXPANDABLE MEMORY AND FLEXIBLE I/O.

CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR

O DETAILED DESIGN IS UNDERWAY FOR ONE LINE, 32 CHARACTER DISPLAY PRODUCT PENDING REVIEW OF THE MARKET RESEARCH DATA.

O PRESENT FUNCTIONAL SPEC:

SIZE:

34" X 8" X 1"

KFYS:

60 INCLUDING NUMERIC PAD

DISPLAY: ONE LINE LCD, 32 CHARACTERS, 5 X 7 DOT MATRIX

MEMORY: 2K BYTES, EXPANDABLE TO 16K BYTES

LANGUAGE: BASIC BUILT IN (COMPARABLE TO 99/4 BASIC)

SOFTWARE: PLUG IN MODULE UP TO 32K BYTES

1/0:

EIGHT LINE I/O BUS FOR FLEXIBLE EXPANSION

PRICE: \$200

O THIS PRODUCT WAS EMPHASIZED TO OFFSET THE OVERALL EFFECT OF COMPETITIVE BASIC POCKET COMPUTERS ON OUR PROGRAMMABLE CALCULATOR BUSINESS.

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CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR COMPONENTS

PROCESSOR: TMS7120 (CMOS MLP) UNDER DEVELOPMENT IN TI JAPAN. LEADERSHIP 8 BIT PROCESSOR.

RAM: INDUSTRY STANDARD 2K X 8 CMOS STATIC RAM.

ROM: WILL BE ABLE TO SUPPORT THREE DIFFERENT TYPES OF ROM INTERNALLY AND IN PLUG IN MODULES.

- STANDARD CMOS ROM WITH MEDIUM ACCESS TIME (.5 MICROSEC).
- JAPANESE CMOS ROM WITH SLOW ACCESS TIME (3-6 MICROSEC).
- TI INTERNAL PROGRAM COUNTER ROM WITH 10 MICROSEC ACCESS TIME (PLANNED CMOS SPEECH ROM).

DISPLAY DRIVE: HITACHI LCD II CONTROLLER AND ONE DUMB DRIVER (2 CHIPS). TOSHIBA MAY BE A SECOND SOURCE FOR THE DUMB DRIVER.

GATE ARRAY: EIGHT VENDORS BEING SURVEYED NOW FOR THIS 300 GATE GATE ARRAY.

06-17-81 CBW 039-815 TI STRICTLY PRIVATE

CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED CALCULATOR MATERIAL/LABOR COSTS

MONTH CPU-MLP	QTY 1.00	PRICE 6.50	40	81	10	82	20	82	30 82 6.50	40 82 6.00	1H 83 5.80	2H 83 5.50	YR_84
RAM 2K	1.00	9.00							9.00				5.00
SROM 16	1.00									8.00	8.00	7.50	7.00
DECODE	1.00	5.50							7.00 5.50	7.00	6.50		5.50
LCD CON	1.00								7.00	5.50	5.00	4.50	4.00
LCD DRI	1.00								3.94	7.00	6.50		4.50
LCD	1.00									3.94	3.50	3.50	3.50
KEYBOAR	1.00	3,50							9.00	8.00	6.00	5.50	5.00
PCB	1.00								3.50	3.50	3.25	3.00	3.00
XTAL	1.00								2.50	2.50	2.50	2.50	2.50
1		0.80							0.80	0.80	0.80	0.80	0.80
XISTOR	1.00								0.10	0.10	0.10	0.10	0.10
DIODE	5.00								0.10	0.10	0.10	0.10	0.10
RES	15.00								0.15	0.15	0.15	0.15	0.15
CAP	4.00								0.20	0.20	0.20	0.20	0.20
PLASTIC	4.00								0.28	0.28	0.28	0.28	0.28
BATTERI	1.00								0.45	0.45	0.45	0.45	0.45
FIEZO	1.00								0.50	0.50	0.50	0.50	0.50
CONN	4.00								0.80	0.80	0.80	0.80	0.80
MECH	5.00	0.30							1.50	1.50	1.40	1.30	1.20
MISC	1.00	1.00							1.00	1.00	1.00	1.00	1.00
PACK	1.00	2.50							2.50	2.50	2.50	2.50	2.50
ADDER									0.31	0.30	0.28	0.26	0.24
USAGE									0.62	0.60	0.55	0.51	0.48
YEN PPV									0.96	0.91	0.83	0.76	0.69
TOT MAT									64.21	61.63	56.99	52.96	49.49
*													
LABOR H									1.60	1.20	1.03	0.92	0.81
LABOR R									5.10	5.20	5.50	5.80	6.50
LABOR\$									8.16	6.24	5.67	5.34	5.27

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CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR COST INDEX

- 1												
	MONTH CAP TLG	QTY	PRICE	40 81 39	10 82 167.00	20 82 180.00	30 82	40 82	1H 83	2H 83	YR 84	
	MOLD DE					67.71	54.17	43.34	69.34	41.60	62.40	
	CUM CAP						216.68			62.40		
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	APP OH						11.42	8.74	7.93	7.47	7.37	
	MOLD DE			7.80	39.64	67.71	108.34	3.94	1.73	0.52	0.31	
	тот мон			7.80	39.64	67.71	119.76	12.68	9.66	7.99	7.68	
	*											
	WARRANT							0.90	19.80	72.00	144.00	
	STORE R						0.03	0.66	2.40	4.80	12.00	
	RMR SCR						0.22	4.75	15.96	29.66	64.39	
	RMR MAT						0.32	6.78	22.79	42.37	91.98	
	RMR RES											
	FRT/DUT						0.64	13.56	45.59	84.73	183.96	
	PCC TOO			80.00	80.00	100.00						
	тот оон			80.00		100.00		26.64	106.54	233.55	496.33	
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	COB			87.80	119.64	167.71	382.48	93.46	84.49	77.99	69.20	
	*											
	AUF						130	130	130	113.75	113.75	
	*											
	GPM			-87.8	-119.6	-167.7	-126.2	401.96	1820.3	2860.8	8910.4	
	GPM %			ur r a ur			-194.2	28.11	35.01	31.44	39.17	
	*											
	RETAIL						200	200	200	175	175	
	RET GPM						35.00		35.00			
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	MRS					0.00	0.50	11.00	40.00	80.00	200	
	CUM MRS					0.00			51.50			
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CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR SCHEDULE

O A PERT SCHEDULE HAS BEEN DEVELOPED WITH THE FOLLOWING KEY MILESTONES.

CRITICAL COMPONENTS SPECIFIED	23	JUL	81
SECOND PASS S/W DESIGN	13	AUG	81
BREADBOARD COMPLETE	01	SEP	81
CRITICAL DESIGN REVIEW	07	0CT	81
MECHANICAL LAYOUT COMPLETE	14	OCT	81
7120 AVAILABLE	03	FEB	82
BASIC IMPLEMENTATION COMPLETE	03	FEB	82
MOLD DESIGN COMPLETE	10	MAR	82
ROM CODE RELEASE	07	APR	82
MOLDS COMPLETE	17	JUN	82
PREPRODUCTION COMPLETE	30	JUL	82
QUAL COMPLETE	04	OCT	82

MINIMUM SLACK BY FUNCTIONAL AREA

ASSEMBLY TOOLING	8	WEEKS
ELECTRICAL	0	WEEKS
MECHANICAL	2	WEEKS
SOFTWARE	0	WEEKS
TEST EQUIPMENT	5	WEEKS

06-17-81 CBW 039-815

The state of the s PGIOF 2 TEXAS INSTRUMENTS PROGRAM ALC PRODUCT A C.B. WILSON SCHEDULE CHART TI-13802-B 6-17-81 MJJASOND*JFMAMJJASOND*JFMA IDENT, NO MARKET RESEARCH PROCESSOR SELECTION Key CompoNENT SELECTION
PRELIMINARY SySTEM DESIGN
PRELIM FUNCTIONAL & TO SPEC FUNCTIONAL BREADBOARD CRITICAL DESIGN REVIEW STRINGY FLOPPY QUAL PRELIMINARY STYLING PRELIMINARY MECH/KEYROARD
PIECHANICAL LAYOUT
FINAL STYLING PROTO PERIATERAL DESKN/FAR MECH DETAIL DESIGN/PERIAH BOX PROTO FLEC EVAL/CORRECT PROD RS-232 I/F DESIGN PROD CASSETTE/S.F. DESIGN MOLD DESIGN TOOLING FAB & PROOF TEST EQ DESIGN FAB Assy Tooling Design / FAB

SCHEDULED EVENT

V COMPLETED EVENT

LEGEND:

REVISED SCHED

4/30/81, CBW, 39-815

TEXAS INSTRUMENTS PROGRAM PROGRAM
ALC PRODUCT A

C. B. WILSON

G-17-81

MJJASOND*JFMA

MJJASOND*JFMA SCHEDULE CHART TI -1 3802-B IDENT, NO. FINAL PWB/SYSTEM LAB TEST FAB PWB's PREPRODUCTION (INC PERIPH) SW DESIGN (INC BASK) SW CODING SW TEST & DERUG 7120 & EXT ROM PRODUCTION QUALIFICATION REVISED SCHEDULE SCHEDULED EVENT LEGEND:

4/30/81, CBW, 39-815

CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR PROBLEMS/ACTIONS

• PROBLEM: TMS 7120 DEVELOPMENT SCHEDULE

MILESTONE	<u>SCHEDULE</u>	FORECAST
TEST BAR EVAL	MARCH 1981	COMPLETE
LOGIC COMPLETE	MAY 1981	70% COMPLETE, COMPLETE IN JUNE
P.G. RELEASE	OCT 1981	DEC 1981
FIRST SLICES	DEC 1981	FEB 1982
DESIGN RELEASE	10 1982	MAR 1982

WE NEED TO BE ABLE TO RELEASE A GATE CODE FOR PROTOTYPE PRODUCTION IN EARLY FEBRUARY.

ACTION: FOCUS ATTENTION ON SCHEDULE THROUGH DIRECT CONTACT AND MICROPROCESSOR STRATEGY REVIEWS. DEVELOP CONTINGENCY PLAN FOR S/W SIMULATION WHICH WOULD ALLOW EARLY APRIL GATE CODE RELEASE WITHOUT SLIPPING PRODUCT INTRODUCTION.

06-17-81 CBW 039-815

TI ALCC RESEARCH SAMPLE FULFILLMENT

CATEGORY OF INTERVIEW	STATUS: 5/22	% INTERV	/IEWS COMF	PLETED 6/3	CUT OFF 6/10	FINAL QUOTA 100%
1. TECHNICAL/SCIENTIFIC- ENGINEERS- SCIENTISTS	49% 57 42	69% 84 54	$\frac{74\%}{84}$ 64	76% 87 65	$\frac{85\%}{96}$	$\frac{225}{112}$ 113
2. COLLEGE PROF/STUDENT - BUSINESS - ENGINEERING	67% 68 65	7 4% 7 5 7 3	7 9% 7 8 7 9	82% 83 81	93% 98 88	$\frac{225}{113}$ 112
3. BUSINESS/FINANCE/ PROFESSIONAL	53%	73%	7 9%	84%	9 5%	225
4. MALL-ABOVE AVERAGE ADULT MALES	96%	100%	100%	100%	100%	225
TOTAL % COMPLETED	66%	79%	83%	85%	93%*	900
INTERVIEWS COMPLETED	596	711	746	769	840*	

^{* 11} ADDITIONAL INTERVIEWS ARE COMPLETE IN THE FIELD, BUT NOT YET IDENTIFIED, BRINGING THE TOTAL TO 851 OR 95% OF THE 900 QUOTA.

CALCULATOR PRODUCTS DIVISION OPERATING STRATEGY REVIEW ADVANCED LANGUAGE CALCULATOR SCHEDULE

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7120 AVAILABLE	03 FEB 82 🗸
	03 FEB 82
MOLD DESIGN COMPLETE	10 MAR 82
ROM CODE RELEASE	07 APR 82 6/11
MOLDS COMPLETE	17 JUN 82 6/24
PREPRODUCTION COMPLETE	30 JUL 82
QUAL COMPLETE	04 OCT 82

• MINIMUM SLACK BY FUNCTIONAL AREA

ASSEMBLY TOOLING	8	WEEKS
ELECTRICAL	0	WEEKS
MECHANICAL	2	WEEKS
SOFTWARE	0	WEEKS
TEST EQUIPMENT	5	WEEKS

OST DECISION PACKAGE SUMMARY

! P	ACKAGE NAME DVANCED LANGUAGE CAI	CULATOR -	PROD A	! C.	B. WI	LLSON	!7/31	/81!0	BJ! ST	LD !N	EW I	E PROD	!SBE !PROE	+ ! !	
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Ō	CLASS 2: % TGT TAM EPSON HC20 PERH BUCK)		1983	1984	1985	1986	SRP	\$ DEV	NPV	RATIO

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CONSUMER PRODUCTS GROUP LONESTAR DTC PLAN

			LUNESTA	IN DIC LE	MIN
	4082	4082	4083	4083	
	FCST	DIC	FCSI	DIC	PLAN TO CLOSE
70C20 PROCESSOR	6.50	6.50	5.50	5.00	VOLUME LEARNING, OUTSIDE VOLUME MANNETON
32K BYTE CMOS ROM	6.25	6.50	6.00	5.75	INDUSTRY VOLUME, THREE SOURCES
2K BYTE CMOS RAM	6.00	6.00	4.80	5.00	INDUSTRY VOLUME, FIVE SOURCES
LCD CONTROLLER/DRIVER	5.30	6.00	4.70	5.00	INDUSTRY VOLUME
LCD DUMB DRIVER	3.35	3.50	2.85	2.50	INDUSTRY VOLUME
GATE ARRAY	8.00	7.00	2.80	2.75	CONVERT TO CUSTOM DESIGN
TOTAL CMOS	35.40	35.50	26.65	26.00	
DISPLAY	7.20	7.00	6.00	6.00	DUAL SOURCE COST REDUCTION PROGRAM
PCB	12.80	12.80	9.00	9.00	MYLAR KEYBOARD CONTACT ELIMINATE GOLD
KEYBOARD	3.15	3.15	2.50	2.44	TWO CAVITY KEYTOP MOLD CONVERSION.
					ELASTOMER VOLUME
PLASTICS	4.76	4.50	4.07	3.76	VOLUME LEARNING AND ELIM. OF EMI COATING
ELECTIRCAL COMP	4.35	4.00	4.05	3.95	CHEAPER POTENTIOMETER
HWD, CONN. & SOCKETS	4.00	1.85	3.40	1.21	SIMP. MECH. DESIGN, QUAL. CHEAPER SOCKET
MANUALS, CASE & PACK	5.10	7.06	4.55	€.93	REDUCE CASE COST
MISCELLANEOUS	80	1.75	59	1.20	
TOTAL MATERIAL	77.56	77.31	60.81	60.49	
HPU	1.2	1.2	.80	.80	REDUCE ELEC COMP, SIMPLIFY MECH ASSEMBLY
LABOR + MOH	14.98	14.98	10.50	10.50	INCLUDE SELF TEST CODE
OOH + PS (10% AUP)	21.46	21.46	16.76	16.76	
TOTAL COST	114.00	113.75	88.07	87.75	
AUP	162.50	162.50	146.25	146.25	
GPM %	29.8	30	39.8	40	
SRP	250.00	250.00	225.00	225.00	
03-11-82 KPP 039-28	9		(EFFERMANIAMENTAL AND A		TI STRICTLY PRIVATE